# Main Currents IN MODERN THOUGHT

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$4 a year, actual cost. Many elect to contribute more. Volunteers to digest journals are invited. All are read retroactively as from October 1st, 1940 to ensure complete coverage. An index of contents and sources will appear annually, summaries and basic bibliographies occasionally. Main currents, as we conceive them, are on page one of November, 1940, issue. For the meaning of colors, please see January, 1941, issue.

## THE UNITY OF THE SOLAR SYSTEM

PHYSICAL SCIENCES: Editorial Summary.

A new illustration of the unity and cyclic interrelation of members of the solar system is afforded by a case of successful weather forecasting based on sunspots and solar radiation. The author, Dr. Abbott, had previously determined the periods of the cyclic change in solar radiation, and had attempted long-range forecasting by extending the same periodicities into the future. Not achieving any marked success, he then realized that he had omitted the most important cycle of all, namely the one-year revolution of earth around the sun. Combining this with his other periods, he forecast mean monthly rainfall for a number of stations, and attained fair success, notably a 71% correlation between predicted and actual rainfall at Peoria, Ill. for each month of the five years since 1935. Thus the real test (successful prediction) by which a hypothesis becomes a scientific theory, has been to some extent fulfilled. (Nature 26/10/40).

This may prepare the way for forecasting less tangible items of history. Solar radiation can obviously influence social changes by its affect on temperature, rainfall, and crops. Future discoveries may reveal a subtler kind of control over biological processes by solar emanations, which may or may not all be electromagnetic like radiant heat and light. As knowledge stands today it is too early to have firm opinions whether such subtle control is to be admitted. Meantime, if we respect unity as an over-riding principle then we must avoid the assumption that there is any other sort of energy. But we may allow ourselves varying levels of such energy. A simple illustration might be taken from doing work. When the work is to be done by simple means like the lever we in effect say to ourselves, "The important thing is to have one end of the bar longer than the other. Space counts here to magnify the force available, not time." When we think of work done by electrical energy we think of its nearly instantaneous nature, as if this were energy operating in a level with new time advantages. As matter is electrically constituted, then the rigidity which makes a lever possible is the same energy at a lower level, so to speak. There is no reason why we should not conceive a level of energy beyond both the above, the crass material and the electro-etheric, a deeper level where energy may be thought-like, or conceptual, and therefore a level in which life and energy begin to show their likenesses. At such a level, implied by Stromberg in The Soul of the Universe, the evident order in biological process which is doubtless the same order seen in electronic orbits at lower levels might very well take precedence of control over the energy side of nature. Thus seeking for more or less veiled examples of biological types of order in what are generally taken as straight energy-matter displays becomes reasonable, even if at the present stage of knowledge such thinking has to be extremely tentative.

Scientific thinking oscillates like a pendulum. The first (mediéval) scientists were of course dominated by religion; by the year 1900 materialism had become dominant, and in the first quarter of the present century practically all the scientific world accepted that viewpoint. From then on, as a result of the new developments in fundamental physics, a pretty thorough revolution has taken place since the material universe now appears to rest on mental or spiritual foundation, and every single electron seems to manifest something very much like free-will.

Many basic questions in physics are still unanswered. Mathematical descriptions, and practical applications, are not the same as full integrated comprehension. There is that moment, for instance, when the swing of a pendulum brings the bob momentarily to rest. The energy is now all potential. When the swing is at the bottom, the energy is all kinetic. How does gravity convert these into each other ? At the one extreme of mathematical physics the field is all-important, and there is no need to explain how gravity grips matter, for matter is virtually just points. But when we think of particles and masses, all the problems as to the relation of atoms to the field come up again. The resolution of this problem between field and atom is the central theme in current thought about relativity and wave mechanics. It was discussed in a lecture by J. M. Thornton lately (Nature, 23/11/40). We shall compact here several items which make us think of the terrestrial and solar order in new ways.

When the X-rays were discovered at the turn of the century, followed by determining the electrical nature of matter, an advance became possible. The planets swing in space-time. Space-time (or the aether) has an electrical component, and since matter is electrical, this component works on the planets at any point where they may be in space. But is this electrical component of the same order as electricity as we know it? Space transmits radiations, yet the nearer we come to achieving purity of space (the vacuum) the more clearly it shows forth the properties of an electrical non-conductor. Light and other forms of radiation which go so freely through space (we suppose), are a compound of two entities, electricity and magnetism, different in character but never travelling apart. They are the Castor and Pollux of the cosmos. They are conceived to be at right angles to each other in a plane and electrical energy flows at right angles to the plane in amounts simply proportional to the product of the strengths of the electrical and the magnetic fields.

What appears to pass so readily through the ninety odd million miles of what is supposed to be empty space from sun to earth is clearly not the electricity that finds the vacuum a non-conductor, but a form of electromagnetic energy to which such transmission is possible. In the case of sunlight, the largest part of the ultraviolet portion is caught in the atmosphere and only about one octave of wave-lengths affects our eyes so as to constitute the glory we call sunlight. It is accompanied by radiant heat, which penetrates the aerosphere, though some also is presumably intercepted at a high level of the air, since temperatures first drop as altitudes are achieved, and then begin to rise again for a certain distance. We must think of the earth as a body exquisitely organised to intercept the sun's radiations in a multitude of ways, and at various levels from the center outward, according to some sort of ordered system only a very little understood. We may have to wait a considerable time for knowledge of the earth's organisation. An aspect of all this is the question if the Euclidean basic shape of the earth. In most discussions of electromagnetics and geophysics the terrestrial system seems to be taken as concentric shells, the lithosphere, the aquasphere, the aerosphere and the several stages outward to what may be vaster distances than we suspect even from the aurora. But the solid earth is known to have some fundamental relations to the tetrahedron and the octahedron, which doubtless determines in part the distribution of electrical charges upon it. Is it not possible to regard the whole globe as both a spheroidal material mass and a well-organised system ? We have not yet arrived at this attitude, or recovered it from earlier philosophies represented in Plato's Timaeus or Kepler's Cosmic Harmony.

The first clue may be the aurora, that vast display of light at both poles (probably

(probably synchronous), which runs its awe-inspiring streamers at heights of from 45 to 600 miles above the earth. This is a sunspot phenomenon also. The earth is a vaster body than we think; the aurora shows this. What we see in the aurora is electrical effects upon and in high levels of nitrogen and oxygen. But what further levels there may be beyond all that, states so near the radiant that there is no resistance and hence no aurora, we do not as yet know from physics. There may be earth-shapes affecting the ionasphere other than the cubics which constitute the lithosphere.

The mystery of order, solar and atomic, seems to lie in the magnetism side of electromagnetism. This latter is best known in such concentrates as are provided by iron and nickel. The existence of fields around bar magnets is familiar to all. The most recent explanations of this phenomenon were summarised in the Bell System Technical Journal, January, 1940, by R. M. Bozoth. Briefly, the iron atom, like all others, is itself a solar system in small, with twenty-six electrons which revolve in four principal shells or orbits. The electrons spin also, like planets (it is supposed from certain recondite properties), and usually electrons with opposite spins are found in one orbit. In an ideal, stable atom as many electrons may spin one way as the other. But in the third orbit of iron there are five electrons with a positive spin and one with a negative spin, and thus a magnetic moment is provided. It is a gyromagnetic effect: that is, the spinning precesses just as the node between the solar ecliptic and the earth's equator precesses to move the equinoxes, as recorded in our calendar over the centuries.

In short, as far as ferromagetism is concerned, magnetism is a function of moving electrical units which behave like small planetary bodies. The point is that the distances out from the sun are approximately determined for planets under a law, first noted by Bode, later restated by Belot, G. Annellini, and most recently by J. Miller, and their motions and spins also follow a system of supremely simple laws described by Newton and Kepler. The distances, number and spin of electrons are also according to law. The question is, is there a unified law for both ? For the whole of this cosmo-atomic system is surely caught up in some sort of over-riding harmony, at present being sought for in relativity ? What we may reasonably anticipate is that at bottom there is a very simple geometrical order which is covered from sight in great masses such as the earth, seen only in section in the plane of the ecliptic, and not visible at all but only inferred from confused and complex indicators in fine-world physics. What we suggest is that this same order may be seen in living organisms, just as we do unquestionably see it in the crystal world statically. In living creatures we have a situation where the intangible biological unity is provided with unstable (that is, sensitive) organic matter, and the operations are all in a narrow temperature range, with moisture control and so on. In short, in the living creature we can see both the whole and the parts, an advantage denied us in atomic systems, in the earth, in the solar order--in each case by reason of different forms of privation.

When thought is oriented more fully so that we look at the world from the biological point of view, we may expect better understanding of the grand order and unity of the solar system, and man's life therein. Such is the conclusion we are made to face over and over as knowledge enlarges. We hope to return to this subject later. The items which immediately follow all have a bearing upon the topic.

F. K.

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1. In connection with the foregoing a study of ionization layers will be found in Jour. of Res. of the Nat. Bur. of Standards, Nov., 1940. 2. A new magnetic barrier, called a "knee", has been located in the upper air over the Atlantic. (Dr. H. E. Halborg at the American Philosophical Society, Philadelphia, Feb. 15). The "knee" has first a phase of violent turbulence during magnetic storms, then it becomes calm and absorbs signals, so in both phases routing of communication via South America is necessary. This particular "knee" is supposed to be associated with the north magnetic pole, which lies in northern Canada. 3. In connection with sunspots, D. Stewart Maclagen (Proc. Univ. Durham Phil. Soc., 10, 175-199; 1940) reports that outbreaks of leaf-beetles, cutworms, leather jackets, antler moth, etc., is equated in frequency to sunspot and weather periodicity over the last hundred years, maxima to maxima. 4. In connection with earth magnetism, "The Geophysical Laboratory, with the cooperation of the Department of Terrestial Magnetism has undertaken the construction of an apparatus to produce extremely high pressures, in the neighborhood of three million pounds per square inch. A pressure of this magnitude corresponds to that found at a depth of 300 miles below the surface of the earth."....."One result already obtained with this apparatus is of great interest in the study of terrestial magnetism, for it has been found that high pressures counteract the tendency of some ferromagnetic substances to lose their magnetism at high temperatures."....."Accordingly, it is possible that part of the earth's magnetism can be accounted for by the presence in its interior of materials which retain their magnetic properties in spite of the high temperatures prevailing there." (Scientific Monthly, December, 1940). 5. "In this paper an attempt has been made to indicate, with some examples, what kinds of changes may be expected at higher pressures."...."Attention has also been called to the present limitations of theoretical physics in predicting very high pressure phenomena from low-pressure measurements. Design of apparatus for very high pressure investigations has been discussed not only for its own sake but also because it illustrates the very interesting field of non-uniform pressure phenomena." (Physical Effects of Extreme Pressures, by R. W. Goranson, in Scientific Monthly, December, 1940). 6. Also, in connection with the above topic, we record the publication of Geomagnetism, by S. Chapman and J. Bartels, (Oxford University Press, 1940 New York; Clarendon Press, Oxford, England, 1940. Two volumes, 1049 Pages, diagrams, etc., 9½ by 6½ inches, cloth $18.00). described in Elect. Eng., Dec., 1940, Vol. 59, No. 12, p. 528: "Volume I gives a detailed description of the observed facts of geomagnetism and the ways in which they are measured, together with brief accounts of lunar and solar motions, the properties of the sun's atmosphere, earth currents, the aurora, the earth's upper atmosphere, and magnetic prospecting. Volume II discusses the analysis and synthesis of geomagnetic data and the physical theories which attempt to explain the facts. Bibliography."/

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PHYSICAL SCIENCE Items

Shrill, high pitched sound waves from a 23 pound aluminum vibrator are so intense that the radiation produces a pressure that can be felt against the hand at a distance of 18 inches from the vibrator. It is capable of supporting small objects such as a penny, or lead shot in mid air. R. S. Dean, Science Supplement, 93, 11; Jan. 17, 1941).

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"At the last meeting of the American Physical Society.....Dr. Thomas A. Read, Westinghouse research physicist, picked up a bar of cast copper, tapped it with a hammer and made it sing like a tuning fork. Then he picked up a similar bar which had been slightly squeezed in a press, tapped that and got only a dull "clunk" Merely dropping a bar on a table was also enough to take the clang out of it. Pounding or cold-working the copper restored the clang." (N Y Times, Feb. 2, 1941). Victor Goldschmidt has shown previously that if the intervals at which atoms in crystals are spaced out could be connected by strings of the same diameter, material and under the same tension the resulting notes from them would be musical.

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THE IDEOLOGIES OF RELIGION, by George Perrigo Conger — Editorial Notice

This book is as important in content as its author is remarkable in the modern scene. Dr. Conger is and has since 1917 been Professor of Philosophy at the University of Minnesota. Cornell, Union Theological Seminary and Columbia are his sources of collegiate training, and among professors he has had an advantage that comes to few ---and might be taken by still fewer---a sabbatical year spent discussing philosophy in India. Only a few readers are likely to have heard of his Theories of Macrocosms and Microcosms, Columbia University Press, 1922, though A World of Epitomizations, and The Horizons of Thought are better known. For those of us who know the author to be a teacher of philosophy who is also a philosopher (in Plato's sense of the word), and who are familiar with his earlier work, the present book is only fulfilment. It deserves to be conspicuous. The reason for that may be principally because so few writers in the philosophical scene have taken seriously the re-orientation of modern thought toward antiquity's general attitude. Dr. Hutchins has, and Dr. Butler also. But it seems to us that teachers of philosophy in general are less aware of what has happened to make Plato (let us say) prized by the physicists, than men like Eddington and Jeans.

THE IDEOLOGIES OF RELIGION is a book far too important to be merely reviewed, for it is nothing less than a survey of thought, indeed of habits of thinking. Re-orientation is the word, for the mark of the East in general is upon this book, and the book,is a precursor of events to come, the uniting of thought. For we today face demands upon us that will make Plato out to be the realist (who is usually the idealist par excellence---and hence just a visionary of ineffective higher worlds), and the old-style realists (especially leftover materialists) to be just confusionists. As a distinguished Indian scholar said in a recent letter, speaking of the opinion of "scholars" on the value of eastern thought: "They no more understand what it is all about than do the modern writers on Plato, whose doctrines are essentially and even in minute details identical with the Indian. Plato's and Indian <u>realism</u> is incomprehensible to our humanist, rationalist, nominalists." It is this inescapable challenge to the West, this world-conflict of attitudes which Dr. Conger is in, and from which he writes calmly, fairly, and impersonally. And that is why the book is too important to be reviewed or briefly digested. We shall make it part of a bibliography relating Eastern to Western thought among the bibliographies we are working upon for readers of MAIN CURRENTS.

Nevertheless we take the opportunity to identify the theme and scope of the work. It opens with a brief discussion of occultism, in the effective meaning of that word. Dr. Conger is not concerned, and no courageous mind should be concerned, with the futilities of pseudo-occultists any more than with the astonishing lunacies of what are sometimes called esoteric movements noticed in the public press---and not infrequently of late in the public courts ! That occultism (the hidden) is a crucial issue is evident when we think that every philosopher has to come up against the question of just how the external (phenomenal) is true to the inner (noumenal). Occultism is the special doctrine which applies to this problem in anything but a bookish and only-logical manner. Hence our author identifies occultism to start with. He then passes on to a chapter on Mysticism, again the case against and for. Then comes an extended discussion of what he calls Supernaturalism, which forms the bulk of the book under one heading. In each department Dr. Conger coins an occasional excellent phrase which compensates for the necessarily brief treatment of each great topic: "The occult appears to be a more or less permanent penumbra of the circle of sciences ordinarily visible for Western minds....the mystic has borne witness not merely to an immediacy about experience, but to a <u>totality</u>." We shall not quote any of the happy phrases pertinent to Supernaturalism, as this category is very large, and as defined here essentially dualistic. The main issue is as to the existence and nature of a God separate from nature. Dr. Conger's own philosophy has previously resolved this problem by a method, with which the writer of this note is in accord, the microcosm doctrine, to which he returns here on page 232. But as in this present work he is

providing a fair survey, the chapters on Supernaturalism must be read entire to ensure that fairness, The remainder of the volume discusses, in the light of the foregoing, the following: Idealism, Pragmatism, Evolutionism, Naturalism, Humanism, Economic Nationalism and The Source and Object of Religion. (He puts Economic Nationalism at the red end of the spectrum, in his own delightful figure, and occultism at the violet end). The book thus constitutes a magnificent bibliography and guide up to this date. F. K.

THE IDEOLOGIES OF RELIGION, by George Perrigo Conger, Round Table Press, 10 Rockefeller Plaza, New York, 1940, pp., $2.50.

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"The church must unify her own members if she is to set forth in her household the ideal of fellowship which she is charged to commend to the world. And she must teach and inspire our generation to seek an economic fellowship in the nation. Our political democracy cannot endure unless it furnishes and rests on a spirit of good will and a more generally fair distribution of the national heritage."
(Henry Sloane Coffin in Yale Review, Winter Number, 1941).

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TOWARD A MORE CHRISTIAN SOCIETY, Henry Sloane Coffin. A Digest.

The whole world, including America, will have to do an about-face spiritually if human progress is to go on and civilization is to be preserved, says Dr. Henry Sloane Coffin in the Winter number of Yale Review. In an article entitled "Ends and Means of a More Christian Society Dr. Coffin says "the church must teach and inspire our generation to seek an economic fellowship in the nation. She must unify her own members if she is to set forth in her household the ideal of fellowship which she is charged to commend to the world."

Dr. Coffin realizes the church is "painfully conscious of her own weakness and incapacity because of her disunion." The end of our political democracy is in sight "unless it furnishes and rests on a spirit of good will and a more generally fair distribution of the national heritage." He says the Christian aim is a society with a fellowship in the national well-being, and that nations will not achieve an enduring peace unless they have a sense of fellowship in goods.

There must also be international political fellowship. If the Allies win the present war there is danger that the new order with Anglo-Saxon domination will be based on "not much better motives and undermined by internal dissensions." Christians must envisage a world in which all nations have their places, including the Axis. "Anglo-Saxons whether Britains or Americans, do not impress the rest of mankind as excelling in humility.....None of us today shares the 19th-century belief in the inevitably of human progress. That was no Christian belief; it is not in the Biblical interpretation of history.....It is not human means on which we rely for a more Christian society, but on an ever-arriving God. It is for us to make sure that Chrisitan convictions and Christian consciences rule us and our country."

Dr. Coffin affirms his belief in the power of karma: "all sin is stupid and blind," he says, "but its frightful harvest is inevitable." Present world conditions are not a judgment in the sense that an angry God sends His punishment upon a generation which had offended Him "but in an orderly universe where whatever is sown must be reaped, the neglects and misdeeds of men and nations bring on their sinister consequences."

Mankind has been unified mechanically and mentally but disintegrated spiritually.

The writer places repentance for the sin of our present society as the first means toward a more Christian society. "If reverence for man as a child of God is lost, the way opens to race prejudice such as anti-semitism, bitter political partisanship, class snobbery, economic exploitation, and so on, which are as fatal to a Christian society as an invasion by Hitler or Stalin."

He says a good case can be made out for the superiority of German efficiency, of Italian freedom of racial prejudice, of Japanese appreciation of things beautiful, of Russian consideration for the working class.

Dr. Coffin believes in a personal God. He names Him as "our most significant Contemporary---the living God, with whom the whole world and we have to do." He talks of a gracious Deity who comes with forgiveness and redemption for His children and declares it is His goodness that leads to repentance. "When men turn to Him in trust, He accepts them and uses their faulty judgments.....to accomplish ends beyond their highest hopes."

Dr. Coffin criticizes the faults of his own countrymen, our failure to achieve fellowship in the sharing of our own people and with other peoples; the blame lies squarely on ourselves if we are trembling lest our cherished mode of life be ruined.

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DEMOCRACY BEGINS AT HOME A Digest.

Some years ago Stuart Chase in his "Tyranny of Words" persuaded us that abstract terminologies must be very suspect, since their referrents are generally undetermined. One supposes that were all agencies of propaganda required to clarify every abstract term they used by appropriate specific applications, that there would soon be an awesome quiet in the barrage along the ether waves. Will Durant in a recent address said: "The excesses of freedom are challenging the life of freedom itself." We note an article entitled "Our Culture Is Threatened", appearing in SCHOOL AND SOCIETY, Vol. 53, No. 1361, for January 25, 1941. Its author is Harold S. Tuttle, Professor of the Philosophy of Education, College of the City of New York. We quote: "What is culture? There are voices aplenty to answer: Culture is that great series of inventions, of material improvements, of institutions, which society has set up--the newspaper, the subway, the radio, the church, art, and a thousand other products achieved by the human race through long centuries. Are these answers true or misleading? Do they reveal or conceal the significant facts?".....'Out across the railroad among the shacks a goat devours a newspaper--absorbing culture. On a subway a drunken man slumps across two seats in a heavy sleep--enjoying the benefits of culture. The newly rich buying costly works of art from a shrewd dealer--a lavish investment in culture. The lookout of a robber gang listens to the radio, catching the police calls --protected by culture." Mr. Tuttle continues, culture is subjective, that it belongs to the inner life. "Culture is the joy felt by the free spirit freely utilizing the world that has molded him." We are not to confuse culture with things. It is, instead, the enrichment of life that comes from the use of things...."Culture is not the array of objects that can be catalogued but the power to appreciate them." Mr. Tuttle then continues to explain that we are dispensing willingly with such things as freedom of speech, academic freedom, intellectual honesty, in order to prevent Hitler from taking them from us. "Science? So far as it is needed, science is diverted into the realm of war, in order to prevent Hitler from coming over and demoralizing science." Industry, too, is reduced to providing armaments, to the extent that Hitler will marvel to see how well we have imitated him. In more subtle forms, our culture is suffering from less spontaneous joy, and is being "smothered by the marsh-gas of fear"... "A few months ago, Hitler is reported to have announced, 'We have set the standard of culture for Europe for the next thousand years'. There is probably more tragic truth

in that announcement than many of his hearers concede--and this is the real threat of Hitlerism!" The present reviewer remembers a statement of George Arundale in "The Lotus Fire" wherein he comments that the forces of retardation are often scarcely distinguishable from the forces of progress, and appear, often, to offer more. Mr. Tuttle decries the use of the press as an instrument of a "glorified and violent nationalism" because it may thereby take many years for an "adequate appreciation of the worth of freedom of the press" to develop again. "Groups, who, even though in all sincerity, arouse race prejudice and class bitterness are nevertheless sacrificing culture. They are crushing, both in themselves and in others, the very attitudes which are indispensible to democracy. Those who deny to others with whom they disagree the civil rights which form the basic foundations of our American government are devitalizing the very democracy which they claim to be defending." Further along, Mr. Tuttle warns us that "there are those also who would gain a following by attaching religious motives to selfish and destructive attitudes toward race and class." We are reminded of F. Creedy's statement in HUMAN NATURE WRIT LARGE, that "The modern nationalist generally presses the Christian God into his service, making him a tribal deity..." Of course, says Creedy, the Christian God is "nothing of the sort."...."Only war hysteria could blind him to the absurdity of the idea that an omnipotent, eternal all-knowing being can fight on his side. If omnipotent, why must he fight?" Reverting again to Mr. Tuttle's article we find a complete "depersonalization" of Hitler. This is wholesome. "The danger of Hitler is the greatest from quarters other than landborders and seaports and the sky." He mentions that advocacy of the trappings of democracy without regard to its spirit is the cause of "the necromancy of hysteria....blind worship of symbols, now become mortal rivals of the inner values which gave them meaning." Stuart Chase might readily assent and include abstractions under the heading of "symbols" with his blessing. We are warned that business interests would have as readily sold to Hitler as to this country, and consistently did prior to the stoppage of sea-traffic. Herein we see whereto a civilization without moral values or realizations of ultimate ends may lead us. So long as a man may profitably sin, he will sin with national honor a convenient pardoner.

H. R.

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THE ARTS IN BALI, by Margaret Mead. A Digest.

Reasons for the character differences between the Lepchas of Sikkim and the Balinese are given by Margaret Mead in "The Arts in Bali" in the Winter, 1941 number of YALE REVIEW. The former have a minimum of symbolic forms, the latter a maximum. There is no one in Bali who does not practice the arts in some small part, either male or female. Arts are part and parcel of the daily life of the average Balinese. Their aesthetic sensibilities are developed far beyond our own, says Miss Mead; in flexibility and skill, interest and appreciation the simplest peasant approaches our idea of connoisseurship. "The Balinese child is exposed from infancy to a gesture, posture system, to a type of attitude, which makes him early susceptible to the more formal patterns of movement and sound which are characteristic of his culture. Altho we may say that the Balinese artistic abilities are learned with the gestures of everyday life combined with early exposure to the rich traditional forms, this gives an account of the <u>how</u> but does not answer the question of the <u>why</u> of the hypertrophy of artistic expression in Bali. It does not explain why the Lepchas are content with meat and drink, while the Balinese have an insatiable appetite for an elaborate patterning of the world. To explain this difference, I think we must turn to the experiences of childhood. Like the Balinese, the Lepchas are a quite well-fed people, altho both have to work hard to produce a surplus." Then Miss Mead goes on to show the difference in bringing up of the Balinese and Lepcha children. The latter are subject to few strains, exposed to few complex stimuli whereas the need of the developing Balinese child is both under and over-stimulated so as to pattern the developing organism. Symbolic activity is emphasized.

Children in America and Europe have followed neither the simple ways of the Lepchas nor the complex ways of the Balinese, but have grown up, insecure and frightened, frustrated and embittered. Totalitarian states have capitalized their needs, built symbols so relevant that they have been able to turn out armies of youth marching willingly to destroy and be destroyed. Today even the Balinese are not safe and their white queen is in exile. "If democracy is to survive we must develop a set of symbols which are better than those the totalitarians have to offer, we here must plan a good society which must be part of a world picture," Miss Mead sums up.

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SOCIAL MAN Items

In 1935 the National Planning Board was established in Washington. Charles Elliott 2nd is its organising secretary. In 1936 Messrs. Wiley published an unofficial volume of its voluminous reports. Last May the American Scientific Congress recommended the extension of the surveys to all the Americas. New British scientists (Nature 11/1/41) look to a world-wide extension of this enterprise. The British Government has appointed the Minister without Portfolio (Mr. Arthur Greenwood) as chairman of a group of Ministers to study re-construction, with a view later to forming a Ministry for this purpose. The United States federal government work above described may be studied in a valuable pamphlet published by the committee and issued by the Superintendent of Documents, Washington, D. C., price ten cents, entitled: Our National Resources, Facts and Problems, National Resources and Planning Board. Is national planning a matter worth ten cents and an hour of your time ?

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"From this /presence of six foreign armies each under its own command in Britain/ derives our right and responsibility in opposing the Nazi regime to call upon the love of liberty and respect for human rights all over the world...until we show ourselves in the War and in our plans for the future more of a democratic nation, we shall not fire the imagination of Europe or of our own society in a way that is commensurate with the leadership devolving upon us." (Nature Jan. 4, 1941)

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The principal book on the philosophy of freedom published during the previous month is Freedom, Its Meaning, edited by Ruth Nanda Anshem, Harcourt Brace, 686 pages, $4.

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High school pupils in Holtville, Ala. are giving lessons to their elders in community service and are making life in this tiny southern village more pleasant for all its inhabitants. The community lives in its school, not the school in the community. "If by unhappy chance," says LIFE of Jan. 13, 1941, "Holtville High School should disappear, most of the social structure of the community and an important part of its economic structure would also collapse." Holtville High has set up a slaughtering and refrigerating plant, a cannery. The pupils have set out 108,000 trees, plowed 600 acres of land, hatched and sold 23,000 blood-tested chickens and sprayed hundreds of peach trees. "The students run the weekly movies. They conduct a community lending library and a barber shop. They watch over the health of young pupils, put out the only local newspaper. For themselves they run a bank which accepts deposits, makes small loans."...."This group action for the good of the group is the best kind of object lesson in a working democracy. The school itself breeds self-reliance."... ..."'Living congenially and happily among others is an art that requires experience," writes Cannie Turnipseed, a pupil in Life, "The democratic spirit at Holtville is not a material thing. We do not turn out high school graduates; we turn out educated citizens."

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THE WAYS OF THINGS, by W. P. Montague — Book Review

This book by a distinguished philosopher and teacher at Columbia University (Barnard College) is so integrated, so comprehending as to the long-separated universes of science, philosophy, mathematics, religion, and ethics that it comes like a prophecy of the future. As it is almost too rich in ideas to be discussed as a whole, only one chapter on Variation, Heredity, and Consciousness will be commented on now.

Montague brings the resources of science and philosophy to bear on the problem of how a meager system of physical particles in a germ plasm or a brain can contain the nearly infinite aggregate of patterns preserving the pasts of heredity and memory. He says in effect that there is no room for the requisite richness of organization in pure space, but this room appears when time is joined with space in what mathematicians call "a serial order of derivatives (or fluxions) with respect to time". For a single particle or a meager group may carry an infinitely rich pattern of accelerations and retardations of its motion through the universe; any motion may have an acceleration or rate-of-change, which acceleration in turn may have a rate-of-change, and this series may be infinite though only its lowest few terms will be observable under ordinary time and space limitations. A meager particle-group may have trailing it in cosmic space-time a column of superposed fluxions or rates-of-change that can hold an unlimited number of patterns. These patterns impress themselves mechanistically on energy-systems less richly freighted, by simple contact or induction, as a mold is impressed on clay or one electric charge induces another, the law of equal and opposite reaction. An atom carries, potentially effective in this instant, the limitless abyss of the atom's past. Latent images of almost infinite richness are carried by germ plasms and passed to the new matter acquired from food, and are also carried by brain substance as a psyche and memory.

In terms of this theory sensation and consciousness are essentially kinds of growth, i.e., accumulation of a growing deposit of pattern in the space-time explored by the growing and enduring entity. The richness of this deposit is a measure of evolution. Thus enriched with manifolds of fluxions, the meager molecular groupings absorb energy from light-waves and also chemical energy from air, water, and food, changing both into potential energy on which they impress their latent patterns. Plants build both kinds of energy into molecular structure; animals build molecular energy into molecular structure and radiant energy into patterns of fluxions that preserve the images of memory. Photosynthesis in the plant kingdom is the analogue of sensation in the animal and of sensation plus rational self-consciousness in man---of all these are precisely the faculty of absorbing energy "neat" from radiation, converting it into the potential energy of structure in plants and of a memory-deposit in animal and man.

So far we have been condensing Dr. Montague's argument. What are its consequences? In a stable universe it would seem to us that accelerations would be balanced by retardations of similar order; that most fluxions would pass repeatedly through zero in a cycle. The theory thus works particularly well as a vibration theory of existence; and it shows us a gamut of possible vibratory orders which is not the familiar spectrum of radiation, but is at right angles to it in time, so to speak; because each interval is a fluxion of the one preceding it---which of course is not the case with the successive frequencies of the ordinary physical spectrum. Now such a gamut of vibratory orders may be said to establish a series of grades or sub-planes of existence, for each gamut degree would be a wave-field of its own just as the little ripples on the big ocean waves establish a wave-field of their own. On the analogy of nature as already known, each wave-field might be expected to contain (a) orders of phenomena almost entirely confined to its own domain, (b) phenomena that take in "vertically" a column down through the gamut. "People" would be phenomena of the b class.

The theory says that scanty matter in a germ plasm bears an inconceivably rich, invisible yet mechanistically conceivable form, a true latent image, which is a pattern

of fluxions and or a column of forces, for a fluxion may also be conceived statically as a stress or force. This image is essentially indifferent to the specific matter on which it is impressed, since it may transferred to new matter acquired from food, water, and air. Being indifferent, it can be associated with any kind of particles, e.g., with a cloud of electronic corpuscles, or with no particles at all but with waves of pure radiant energy, for waves may bear fluxions as well as particles. As a corollary to this indifference to specific matter, Montague shows that immortality is not impossible. He thinks that memory-deposits continue to exist after the meager systems to which they were attached in brain-tissues are gone, ---preserved by being members of a whole universe of similar entities.

Various obscure and neglected types of psychological data should be more investigated in the light of this theory. For it enables us to think of, and---who knows? ---perhaps to utilize, the energies of emotion and thought as one would electricity, i.e., as mechanistic patterns of forces, objectively and independently existing somewhere---occupying a kind of space, though not three-dimensional space. Certain psychically sensitive people get vivid and often amazingly correct impressions of the thoughts, emotions, and personal characters of others as moving, vibrating, spatial figures or designs, with the wave-characteristic of color; and they see the cloud-like substance which bears these patterns impress them upon other cloud-like bodies---this being a crude description, naturally. Such people, who seem to "see" mechanistic force-like operations and configurations in a dimensioned space-field, may perhaps be more highly developed and nearer the truth of things than ordinary people who merely "feel" or "sense" qualitites called emotions and thoughts. But even ordinary people have occasional tendencies to receive "images" of intangible qualities as if the latter had a trace of extensional form, in a dim and darkling way visible or visual. In the same kind of space in which we "see" our memory-pictures, and to the same degree of visual vividness, many of us get traces of distinctive outlines when we think of intangibles like a year, dates, the number series, names, melodies, etc. Some on hearing music receive dim visions of phytoid or rocket-like forms flowing and expanding. Rhythms are translated in the mind into designs. And Montague's theory calls attention to the omni-present <u>rhythm</u> which pervades everything in the universe. For patterns of fluxions are patterns of subtle rhythms as well as intricate bundles of forces which continue the past of heredity and memory into the present and future.

B. L. W.

THE WAYS OF THINGS, W. P. Montague, Prentice-Hall, New York, 1940

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TIMES THAT TRY MEN'S SOULS — A Note On Prejudice.

Even those of us who are (we believe) old campaigners and stout of heart feel qualms as the spirit of fascism rises out of the turmoil of our times in all sorts of non-political parts of the social scene. Surely this is a day of reckoning in which we must all think our principles through ! In Technology Review, January, 1941, page 117, in the course of a splendid article by Cecilia Payne-Gaposchkin on Man's Relation to the Cosmos, occur these words: "Living matter seems to have stuck even more closely to the composition of the cosmos than to that of the earth itself. If you analyze yourself, you will find that you contain relatively more atoms of hydrogen, carbon, nitrogen, and oxygen than the earth does on the average. In building himself, the living creature has used the typical cosmic sample. He is the child of the stars, rather than of the earth." In the same month as appeared the foregoing occurred one of the most unpleasant symptoms of the times, which crosses the spirit of that passage ---and its fact---like a lurid, destructive fire-bomb, an attempt not to help but to hinder the extension of knowledge of our relation to that very cosmos of which we are made. We refer to a report issued by the Boston and Cambridge Branch of the American Association of Scientific Workers as to the evil effects psychologically of astrology. Instead of making a long and systematic study of the subject, as they would demand of anyone attempting to enter one of their own fields, we have here the astonishing sight

of a so-called scientific body proposing to reject inquiry into a new knowledge unless the terms are satisfactory to all previous knowledge ! It is of the very nature of the case that the new will want its own terms. The following passage in the report is quite false; "In the case of planets discovered in our times (Uranus, Neptune and Pluto) the evidence is conclusive that their influence on men were ascribed by the astrologers before preliminary observational tests of the influences could have been made...." Not only did the late Alan Leo and others make extensive studies of the place of Uranus and Neptune in the scheme of things, but the rulership of the planets is determined entirely by the order of their distance from the sun---as the present writer can show, though he is no astrologer, and agrees that astrologers should set their own house in order, and come to grips with the far too prevalent lack of scientific spirit and the commercialism abroad in astrology. But it is astrologers who should do this. How would the scientific workers of Cambridge and Boston like it if the doctrine of relativity were judged by the churches or police courts ? Some religionists think it is a dangerous doctrine, because it appears to deny the existence of a personal God. Medicine is an art, not a science. Should the physicists enter the field and deal with the doctors ? The gravity of such crusading conduct in this hour cannot be overestimated. Anyone who knows the long struggle of the homeopaths, then of the osteopaths and after them of every form of new knowledge in the domain of medicine against the orthodox schools realises that nothing is more dangerous for mankind than for people ignorant of something assuming that because they know something else (and are well established in the public esteem), they are therefore called upon to save humanity. The war is about this very issue among others. The astrologers stand in the place of condemned races. We are sad to think what would happen to this country if the people who issue a report of this sort were to become part of a more or less fascist society as a result of America's attempts to save democracy. We repeat: we of MAIN CURRENTS are not astrologers, and we assent to the charge that there is much nonsense and also fakery in that field. But we think it is premature at any time for ignorance to attempt to make truth. And when we see what the scientists have liberated into the political field for mankind's destruction (bombing planes, poison gas, explosives) we feel entitled to ask these ladies and gentlemen in Cambridge and Boston to enter that field first, of politics and economic affairs, and redeem society from the misery the physicists and chemists have made by giving to ignorant and selfish men these cruel instruments. When the Association has lead the way there we shall respect it more should it criticize the astrologers again---after years of careful training in the study of this ancient, broken-down art, which someday will come into its own once more by self-examination.

Before the above-discussed disheartening item came to our attention we had made notes of the following remarks we proposed to make in this issue---and which we now make, as they are more necessary than ever: We must challenge the assumptions that lie under the whole mass of modern thought and propagated there by the press for years, even the so-called scientific press quite often. This is the notion that science will soon know all. This is Unphilosophical Humanism. The corollary is that we laymen should have faith in doctor, lawyer, merchant, chief---we richmen, poormen, beggarmen, thief. The fact is that science will not soon know all. More, physical or material science is no kind of guide---nor biological nor even psychological sciences so long as they succumb to the domination of the kind of thought quite necessary to the physical sciences. It will be thousands of years before we know all by means of such a "trust me" fascist attitude in science---and never by partial science. We think with gratitude of a man like Dr. Einstein. He is aware of the fact that even relativity and wave mechanics have not been welded into one whole. He knows that biology as a whole and physics are very far apart as yet, indeed, and we have never seen a word by him presuming that physicists should turn to and set biology in order, or psychology. But his attitude, truly modest and really scientific, is not seen everywhere. Let the sceintist stick to his facts, and let him pull up short anyone who violates truth. But when he arrogates to himself the right to pass on experience as a whole, and to say what shall and shall not be valued, he has joined the Axis. We respect the devotion and the talent of these many workers, and in their lives we sometimes find

humanitarians who fill us with hope and inspiration. But that is apart from this evil which originates not in the humble great men but the little men, the withering blast of cold selfishness and vanity which arises too often from organisations which belong to and support too often an old order. Surely it is this dimly felt despondency by many men that prompted much questioning and even tendencies to revolt in several medical and scientific bodies in 1940 ? There is a real searching-out in the events of our times. Who really is for freedom and spirit and who is for matter and force ?

If any reader should think we are seeing ghosts, we would like to remind him that Woodrow Wilson, the martyr of the last war, saw then the menace of the spirit of the laboratory stealing out of its proper domain to assert its dominion in realms where it has no rights. And the war today is only an enlargement of the war then. It is the duty, we feel, of every true lover of democracy to give all he can to the causes which are part of democracy in every field of endeavour. MAIN CURRENTS is for those who believe the old has much to teach the new, the East the West, the subjective to interpret the objective. Surely we must all have courage to stand by these principles of unity as against materialism, western parochialism and the conceit of modernity ? We are not thinking only of astrology. But this event provides an occasion. If serious astrologers demand good natal data to work upon, even a serious thinker like Waldemar Kaempffert, science editor of the New York Times (26/1/41) makes fun of them---just because, like any scientists, they want exactness of data for good results. Mr. Kaempffert makes reference to an assumption, that the month and day of birth have meaning by themselves, which a tyro in astrologer knows is not enough. That is, he takes the very newspaper astrology he deplores and supposes it represents the science, and then derides it. If any reader still thinks we are chasing phantoms, he is urged to read We Answer A Critic by Grant Lewi in Horoscope for February (10¢, 149 Madison Ave. NYC). There he will find a restrained account of sordid and cynical doings anent astrology by Good Housekeeping magazine such as will fill him with doubts about what is supposed to be a magazine of high standards. We prefer Mr. Lewi, surrounded by medical advertisements and incarnated in pulp, to the imitation ethics of Mr. Hearst's magazine on glossy paper. F. K.

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A BROTHERHOOD OF THOUGHT Linguistics

There is no word for "word" in Chinese. The nearest thing is the element tsz, which is translated "word" but means rather "syllable" or "syllabic element". Many such elements never occur free but only in a few combinations, like the pyr- in "pyrometer". Words in the sense of vocabulary units exist as either of one or two syllables, a fact obscured by the traditional Chinese system of writing, which keeps every syllable separate. This was pointed out by Dr. Yen Ren Chao of Yale in a paper "Word Conceptions in Chinese" at the meeting of the Linguistic Society of America in Providence, R. I., 12/30/40. The nature of Chinese grammar is only just beginning to be understood; Dr. Chao and others have exploded the idea that Chinese is a "monosyllabic" language. At the same meeting Dr. G. A. Kennedy of Yale, analyzing "Complex Attributive Expressions in Chinese" showed that Chinese has no relative clauses, and that a different kind of order-system rules the logic of such relationships. If the element te used in this logic be translated "-ish", then "The House that Jack Built" would go in Chinese: "This is Jack-ish Build-ish house; this is Jack-ish build-ish house-ish in-ish lie-ish malt"--etc.

It is not sufficiently realized that the ideal of world-wide fraternity and cooperation fails if it does not include ability to adjust intellectually as well as emotionally to our brethren of other countries. The West has attained some emotional understanding of the East through the esthetic and belles-lettres type of approach, but this has not bridged the intellectual gulf; we are no nearer to understanding the types of logical thinking which are reflected in truly Eastern forms of scientific

thought or analysis of nature. This requires linguistic research into the logics of native languages, and realization that they have equal scientific validity with our own thinking habits.

The fact that the human speech function results in definite crystallizations of sound which then function as essential building-block material for language, has had wide currency among linguists for only about 20 years, and is the substance of the "phonemic" theory or approach. Prof. Bernard Block of Brown University, in a paper read at Providence 12/30/40 brought new contributions to this viewpoint, which is giving linguistics an exactness like that which the concepts of atom and molecule gave to chemistry. Words are sequences of phonemes (in dimensional terminology, both words and phonemes are forms in time-space). But phonemes are not sequences of still smaller units; instead they are systems of alternation of subordinate units, which Block calls allophones, a term invented by B. L. Whorf in 1936. Allophones are sounds which are objectively different but psychologically same and interchange without the volition of the native speaker. Thus the r's in American English run, three, and year are shown by acoustic tests to be 3 different sounds, having little objective resemblance. They are the three allophones or allotropic forms which function as the same speech-molecule (phoneme), namely r; much as carbon exists in the alternative forms of diamond, graphite, and amorphous carbon, or, carbon is the systemic whole within which these three mineral entities alternate depending on the conditions of crystallization. The analogy should not be pushed too far, but it is interesting. The study of allophones is phonetics, that of phonemes is phonemics; together they constitute descriptive phonology. Block and G. L. Trager of Yale have recently published a new phonetic alphabet which is an improvement over that of the International Phonetic Association and other previous systems. B. L. W.

English says "he puts a halter on the horse". The Shawnee language reports the same event by the single compound word thaki-chaalee-pi-la. Strange to say, the parts of this word contain no reference to halters, horses, or "putting". The first part means a configuration or setup of holding, the second "in the nose-region", the third "by tying action", and the final -la shows that all this is done to a third-person animate entity. Languages remote in pattern from our own, like this American Indian tongue, show that different languages are different systems of analyzing and logically interpreting events; they are capable of getting different things out of the same world-background. For this reason the publication of C. F. Voegelin's "Shawnee Stems" provides important material for the better understanding of problems of meaning. It is a dictionary of Shawnee which dissects hundreds of these remarkable synthetic-idea formations, so strange to us, yet often as beautiful and neat as a theorem of Euclid or a bit of Bach counterpoint! A dictionary of the extinct Miami language, the work of the late J. P. Dunn, is included parallel with Voegelin's brilliant exposition of Shawnee. Published in five parts, Part IV has an appendix "Gestalt Technique of Stem Composition in Shawnee" by B. L. Whorf, which connects the Shawnee world-picture with the findings of gestalt psychology.

Shawnee Stems and the Jacob P. Dunn Miami Dictionary, C. F. Voegelin, Indiana Historical Society, Indianapolis, 1940.

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PUBLIC PRIVACY — Linguistics: Items

Eight Sac and Fox Indians attached to the 18th Iowa Infantry are to be trained to operate a walkie-talkie radio-telephone unit, speaking their own dialect. This language is so little known that even if the conversations are overheard by the enemy the message would be unintelligible. (N Y Times Feb. 16, 1941.) The Sac and Fox men are descended from Indians of the Black Hawk War that Lincoln saw. Youngbear, the signaller's chief, is from a settled unit of the tribe who own land by purchase near Tama, Iowa.

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"Of all the curiosities in the natural history of the South Seas, the mbalolo stands first. It is a thin, jointed worm about eighteen inches long which lives its life fathoms deep in the fissures of the coral reef, rising twice a year to die, phoenix-like, in the propagation of its kind. Being mere living vermicelli, with no head but a mouth, and no body but a transparent pipe, it ought to live a life of inglorious security, but it has one remarkable quality. It is a natural almanac with a fixed day for its appearance, and it will not turn from this fixture for all the hurricanes that ever raged south of the line. In the mere observance of fixed intervals there would be no greater miracle than our bodies can show. The wonder lies in the fact that the mbalolo keeps both lunar and solar time, reconciling and adjusting them at regular intervals. It swarms to the surface of the sea two nights a year, in the third quarter of the moon in October and November, and it has never departed from the time during the century in which it has been watched by Europeans. The moon directs its choice of the day, the sun its choice of the month. It cannot maintain regular intervals of either twelve or thirteen lunations without changing the calendar month of its re-appearance. For two years it rises after the lapse of twelve lunations, and every third year at the thirteenth. Even this arrangement would gradually sunder solar and lunar time, and so to meet this difficulty it intercalates once in every twenty-eight years an extra lunation. No one has attempted to show what are the impulses that lead to its rise on the appointed day and keep it back every three and every twenty-eight years. The reefs from which the mbalolo rises are far apart. Many centuries must have passed before the natives became impressed with the regularity of the mbalolo's appearance and gave its name to their calendar. October is the 'Little Mbalolo' and November the 'Great Mbalolo', but you may scour the reefs in a fast canoe and see nothing on these nights. Decades must have passed before the unmethodical intellect of savage humanity had come to look for the annual occurrence of the school and had noted the day and hour. The great annual feast which of the mbalolo is at once provider and the provision had given names to the months before any European had arrived in the group."

(From, The Scene Changes, by Sir Basil Thompson, the celebrated head of Scotland Yard, in his memoirs of life in the Tonga Group. pp. 36-37)

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The need to enlarge the definition of life to take in the crystals is emphasised once more by the award February 6th, 1941, of the Gold Medal of the Institute of New York to Dr. W. M. Stanley. Dr. Stanley crystallised the virus of the tobacco plant, which crystals after years can be brought into contact with living cells and communicates to them its modifying influence. If ordinary micro-organisms are alive (and they are), then the viruses are also alive, though we judge this only from their behaviour since the individual constitutent of viruses cannot be seen as yet. Then, if viruses are alive, their life goes on in their crystal form. Are we not very near to having to acknowledge that crystals are alive---therefore that all matter is alive, since today matter is generally allowed to be crystalline au fond? This step Dr. Stanley has taken in his address of acceptance of the award. Few events in the last ten years have been as important to philosophy as this one. (See Science, Feb. 14, 1941).

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The new electron microscope, which has 100,000 power, has now been simplified (N Y Times Jan. 31, 1941), and may soon be applied to the elucidation of virus structure. The action of catalysts also may be watched, David Dietz reminds us (in World Telegram, same date). We stand truly upon the verge of enormous enlargement of data through this instrument, the new G.E. million-volt X-ray generator (Time, 30/12/40) and through the Mt. Palomar telescope. These are thrilling times, and the impending synthesis of thought makes war all the more revolting, degrading, needless in the decent opinion of mankind.

"In the island of Beqa there is a ceremonial preparation of the masawe, a dracaena that grows in profusion on the grassy hillsides.....A great pit is dug, filled with large stones and blazing logs, and when these have burned down and the stones are at white heat the oven is ready for the mesawe. At this point of the ceremony the clan Naivilaukata is called upon to leap into the oven.....and walk unharmed upon the hot stones that would scorch the feet of any but the descendants of the dauntless Tui Nkualita. When I witnessed the ceremony, only twice had Europeans been fortunate to see it, and I was determined to get first-hand evidence. At Waisoma I found a shallow pit nineteen feet wide, dug in the sandy soil a stone's throw from the high water mark. It was piled high with blazing logs and round stones the size of a man's head. Mingled with the roar of the fire were sharp reports as splinters flew from the stones. Men were dragging up more logs and rolling them into the blaze while on the brink of the fiery pit stood Jonathan Dambea directing the proceedings with an air of noble calm.....When all was ready we were called to the pit. The fire had been burning for four hours, the white-hot mass of stones was throwing out a heat besides which the scorching sun was a pleasant relief. They were dragging the burning logs out of the pit with green vines, and a cone of glowing stones remained in the middle. These were raked flat with green saplings which acted like the teeth of a huge rake. This continued until an even floor of hot stones was produced. It took fully half an hour, but tongues of flames playing among the stones left no doubt about the heat. All this time, Jonathan preserved the air of holy calm that never left his face. There was a cry of: "Vutu, Vutu!" and forth from the bush marched sixteen men, two and two, dressed in garlands and fringes. They tramped straight to the brink. The leading couple showed consternation on their faces, but did not pause, because their followers would have pushed forward. They stepped down upon the stones and marched round the pit, planting their feet on each stone. The crowd surged forward and flung in great bundles of green leaves, but the bundles struck the last pair in the procession and cut them off from their fellows, so they stayed where they were, trampling down the leaves in a dense cloud of steam from the boiling sap. The others leapt back to their assistance, shouting and trampling.....By a pre-conserted arrangement with the noble Jonathan a large stone had been hooked out of the pit to my feet and, at the moment the first man entered the pit, I dropped a pocket-handkerchief lightly on the stone, and snatched what remained off it as the last man left the stones. During the twenty or thirty seconds it lay there, every fold of the handkerchief that touched the stone was charred, and the rest of it was scorched yellow. So the stones were really hot. We caught four or five of the performers as they came out, and closely examined the soles of their feet. They were cool and showed no trace of scorching, nor were their anklets of dried tree fern burnt. This, explained Jonathan, is part of the miracle, for dried tree fern is as combustible as tinder, and flames were shooting among the stones. Sceptics had affirmed that the skin of a Fijian sole was so thick that it would not feel a burn. Whether this is true of the ball and heel or not, the instep is covered with skin little thicker than our own, and we saw the men plant their instepc fairly on the stone."

(The Scene Changes, Sir Basil Thompson, Doubleday, 1937, pp. 175-179).

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TWINS, AGAIN

The growth curves of Human skulls are determined by inheritance and environment, and the soft skull of the infant can be, and in some tribes is, moulded artificially. The matural modulus of growth has been studied (C. B. Davenport, Proc. AM. Phil. Soc., 83; 1940) and the interesting finding is that identical twins (monozygotic) run parallel courses, and in dizygotic twins the growth curves do not correspond. In the former the pair of curves may or may not be close together. Nevertheless the curves will be parallel. (This item continues the series of notes of new data which show the astonishing linkage of identical twins all through life, in all kinds of features, including mere events and also physical and psychological characteristics).

A new definition of culture (in the anthropological sense) based on the concept of existence in space-time is advocated by Alfred Blumenthal (American Anthropologist, Oct.-Dec. 1940, p. 571). The definition is too long to give in full; we may quote from it: "culture is the world stream of cultural ideas from the first in the cosmos to the great body of them in the present....plus.."and here follows a series of other extensive cosmical notions related to the preceding. Supplementary definitions of "cultural idea", "stream", and other terms used in the main definition are required. Thus "stream...refers to ...objects that move successively in space-time....personality and culture are streams" (p. 581). For some time anthropologists have recognized that anthropology is not (except for so-called "physical anthropology") a branch of biology, and its subject is not biological phenomena but cultural phenomena. Culture, the theme of anthropology, is recognized to be "superorganic" (an excellent term originating with A. L. Kroeber). The new definition of culture is the first to our knowledge to see the realm of the superorganic as a space-time whole. This reviewer feels that anthropologists will be slow to adopt Blumenthal's definition, not because it uses space-time but for other reasons -- difficulties with his ancillary definitions, and so on. But anyway, this conception is a sign of the times and a most interesting and suggestive pointer of the trend of modern thought.

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The effect of temperature on stature was discussed by Dr. C. A. Mills of the University of Cincinnati in Science of November 8th. He anticipates an arresting of size-increase, stature having gained an inch approximately every four generation during the last three quarters of a century.

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Dr. Ales Hrdlicka concludes from measurements of the skulls of 150 members of the American Academy of Sciences that size and breadth, rather than height of brow, is the index of the best minds. The basic assumption with regard to the source material will be noted by our readers without our help. (NY Times 23/1/41)

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Still another Cro-Magnon decorated cave has come to light, near Montignac in Southwestern France. Bulls fourteen feet long are described by the Abbe Henri Breuil in an account in Nature (25/1/41), and a black rhineroceros, a human figure with arms of a javelin character, and other figures mentioned.

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The Census Bureau reports our national median age to be 28.9 now instead of 26.4 in 1930. As a nation we seem to grow older over-all, and one would like to think wiser under-all. (N Y Times 29/1/41)

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